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St. Louis Park Historical Society

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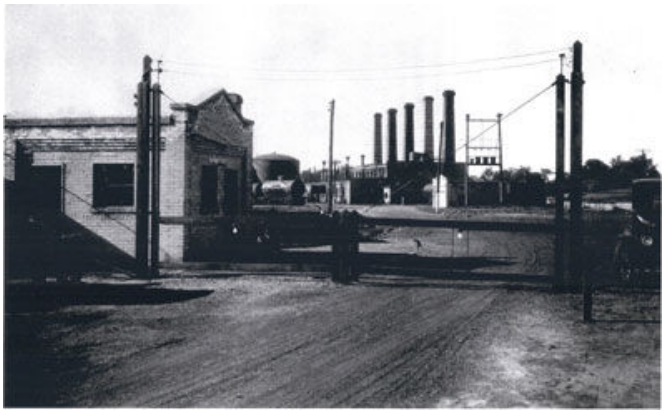
REPUBLIC CREOSOTING INC.

Having a creosote plant in our town has been a mixed blessing. Of course there was the smell in the air, the taste in the water, and the fear of a health risk. On the other hand, the plant provided much-needed employment for many people over a period of some 65 years and produced valuable building products instrumental to the early growth of St. Louis Park and area railroads. It's gone now, cleaned up and decontaminated - in fact, St. Louis Park has some of the most tested water in the State. But there are still some who wonder if there is "something in the water."



HISTORY

Information on the history of Reilly Tar and Chemical is from the book Good Chemistry: The Story of P.C. Reilly and Reilly Industries *by Bill Beck (1996).*

Republic Creosoting Company got its start in 1896 when Peter Celestine (P.C.) Reilly bought the Western Creosoting Co. in Indianapolis. In 1905 he incorporated as Republic Creosoting Co. Reilly was an innovator, inventing the Reilly still in 1914, which could produce more creosote oil from a gallon of coal tar.

In 1904 Reilly set up a coal tar refinery and creosoting plant in Minneapolis. This plant was located by the flour mills in Southeast Minneapolis and made paving blocks for streets. By 1912 the General Manager was Arthur E. Larkin, who had been a U of M football star in 1910.

In 1916 Republic closed the Minneapolis plant and moved its operations to St. Louis Park. Arthur Larkin became the General Manager of the St. Louis Park plant. The office remained in Minneapolis until it too moved to St. Louis Park in 1918. From 1918-1920 Republic maintained a research lab in Minneapolis. The first Superintendent of the St. Louis Park Refinery was Carl E. Williams, who was transferred from Indianapolis. Carl's brother J. Frank Williams also came from Indianapolis in 1918 and worked mostly as a

chemist; see his **memoir.**

The perimeters of the tract were: south of 32nd Street, north of Walker Street, west of Gorham and Republic and east of approximately Pennsylvania Ave. The origins of the property can be discerned from an 1893 map:

- The north half of the property (between 32nd and 34th) in 1893 belonged to the West Minneapolis Land and Investment Co.
- The next block south (between 34th and 35th) had been platted into blocks and lots.
- The southernmost tier (between 35th and Walker Street) was divided into two sections. The western section had been platted, and the eastern section was the 10-acre **Esterly Harvester Company**. In 1897 the Esterly site was taken over by and expanded into the 36-acre **Minnesota Sugar Company**. The Sugar Company went out of business in 1905.
- There may have been a headquarters building in a "brown house" on the north side of Walker, east of present-day Louisiana (which wasn't there until well after the plant had closed). A 1966 ad gives the address as 7200 Walker Street.

The plant was enlarged in the 1920s to its full 80 acres, presumably to the north, to store and season ties and lumber. Virgil Neitzel seemed to remember that Oak Hill Park was originally part of the property, and was donated to the City. A related company south of Walker Street, Wheeler Lumber and Bridge supply, used Republic's products for their own work, making wooden culverts from creosote timbers.

REFINERY

The plant had two basic functions. The first was the refinery, where coal tar was distilled into byproducts. The crude coal tar was obtained by the Koppers plant in St. Paul, which produced gas for the gas lights and cooking. J. Frank Williams noted that there is only one gallon of crude tar in a ton of coal, after the coal is broken down, although later approximately 10 gallons could be produced. The coal tar arrived by train and was transferred to large stills. In the 1920s a "cracking unit" was built to convert low-grade tars to quality products.

The byproducts included:

- Pitch, used in tar paper for roofing, among other things. A 1966 article in the *Sun* told of a new ready-to-serve electrode binder pitch used by aluminum companies for packaging. The pitch was transported from St. Louis Park to Flathead Lake in Montana in an 18,000 gallon tank railroad car, kept at a temperature of 400 degrees. There is was used to make aluminum foil.
- Carbon coke, "the ideal ashless fuel" that "burns with a bluewhite flame without smoke or soot and because of its purity produces more heat than an equal quantity of any grade of coal or commercial coke."
- Naptha

- Creosote, used to preserve wood, usually white pine, for telephone poles, bridge pilings, fence posts, but particularly railroad ties. Treating wood with creosote could extend its life 30-50 years. It is also used as a pesticide, insecticide, and fungicide, and in medicines to treat skin diseases such as psoriasis.
- Coal tar, including "Standardized tar products for road construction." The company advertised that "There's Permanence in BITUVIA Built Roads." A 1935 ad promised full value for every dollar invested, and that Bituvia roads can be constructed at low cost, were durable, resistant to traffic wear, and could be maintained at low cost. "Ask Your Councilman to specify Bituvia Built Roads." Tar is also used for waterproofing building materials.

TREATMENT PLANT

The second function was the treatment plant, where wood was treated with creosote. The process started when the wood, usually 8 ft. railroad ties, arrived by train, and had to be unloaded manually. The men who carried out this arduous task were called "tie buckers," a special breed of men who unloaded, dipped, stacked, and moved railroad ties to the train, all by hand. One legendary tie bucker was **Dutch Reider**, who perhaps in legend only, could carry two at a time.

Workers at Republic Creosoting's wood treatment plant in Saint Louis Park Minnesota.

Virgil Neitzel's memoir described the treament process. "The huge processing tank held about 25 gondolas loaded with 8 ft. ties. The gondolas were rolled into the tanks on tracks, doors on either side of the tank were sealed and creosote filled the vacuum tank. Gauges and timing clocks assured that the processing for each batch of material met the specific requirements of the customer."

WORKING AT THE PLANT

At the turn of the last century, Monitor Drill Works was the major employer in town, according to Census data. Monitor left St. Louis Park in 1929, however, and the Creosote Plant took its place as the major employer of working men in the Park. During the Depression the plant only operated three days a week, but soon went back to full capacity. The plant kept many families fed during the Depression and for decades afterward.

In his autobiography, Ben Brown describes his career at the plant, starting upon his discharge from the Civilian Conservation Corps in 1936. He was hired as a day laborer, making 40 cents per hour, paid in cash on Friday nights from the back of a Brinks truck.

The starting time was 7:30 A.M. and if you punched in at 7:31 you lost the

first half hour of pay. The work was brutal and dirty. You were called on to do anything that was necessary at the time. I helped often with the pipe fitters, loaded coke, weighed trucks at the scale house, loaded tank trucks with road tar, barreled roofing pitch and on and on whatever had to be done.

After being there awhile I began cleaning stills. This paid $5 and was piece work. We got $5 no matter how long it took to clean one still. We started work at 3:00 A.M. and were usually through before 8:00 A.M. The stills had been fired the evening before and cooled with water after midnight. The coke was still hot and many time would start on fire after it was wheeled outside. We wore a cap, pants, gloves and wooden shoes that were about an inch and a half thick. Inside the stills we would often stand in extremely hot water and it was hot inside. We took breaks often and in the Winter we'd go out on the coke pile to cool off. We'd sit there with no shirt on and the steam would just radiate from our bodies. These were jobs that man unemployed men refused because the job was too dirty and physically challenging. I didn't like it either but it got me out of the CCC.

Virgil Neitzel remembered: "One of the worst jobs that the guys could be assigned to was chipping the coke off the floor of the still. The confinement and heat were tough, and workers would experience the skin peeling off of their faces. This was real manual labor! The pay was not that great, but it was a steady job - even during the Depression of the 1930s when Dad was fortunate to be working at all. Harry Holstrom, superintendent of the plant, was a good 'boss.' The typical Creosote worker claimed that 'it took a little alcohol to thin out that creosote.' After work, Dad would usually stop at the nearby Reiss Tavern for beer. The guys, for the most part, were hard workers and hard drinkers. Even during prohibition years, it was easy to find the needed liquid refreshments." For Neitzel's complete memoir, see his Oak Hill and the Republic Creosoting Co. chapter in **Something in the Water.**

DANGER

Not only was the work hard and dirty, it could be dangerous. 40,000 gallons of oil exploded at the plant at midnight on July 3, 1921, reported the *Minneapolis Tribune*. Damage was estimated at $25,000. "The oil let loose with a low, muffled rumble. Neighbors several blocks away were disturbed and on reaching their windows saw flames shooting high in the air. The oil did not run from the vats, but burned in three furnaces. A new process being used to separate the oil for creosoting work was blamed as the probable cause. The blast tore the roof from the building... A fourth vat adjoining the three that exploded was saved." A Minneapolis engine company was called to assist in fighting the fire.

The *Minneapolis Tribune* reported on a fire at the Creosote Plant on December 15, 1922: "Flames accompanied by dense clouds of black smoke shot hundred of feet into the air... destroying one-half the main condensory plant... causing a loss of $100,000. Four Minneapolis fire companies battled desperately for several hours before the oil-fed blaze was subdued. Five huge tanks containing 1,000,000 gallons of creosoting oil were menaced by the fire." The five tanks and the main building of the company were saved when a tunnel between the tanks were blocked. "Work was handicapped by the intense cold and by dense clouds of smoke which surrounded the plant. The main plant was coated with ice." The fire was caused by spontaneous combustion, endangering 50 workers who escaped without injury. The rest of the plant was saved by closing fire walls. Many of the 150 employees would be out of work until repairs were made.

A fire in April 1939 brought between 2,000 and 3,000 onlookers to Highway 7. The blaze was started by boys burning grass along a 20-acre swamp where the plant drained its byproducts. The fire swept over the 20 acres of grassland and then ignited a 20-year accumulation of oils and greases in the marshy bottoms. Firemen were powerless to stop it and concentrated on preventing it from spreading. The swamp was located between Highway 7, Lake Street, Quebec, and Louisiana.

No doubt there were many more fires at the plant, including a smoky one in 1964.

LOYALTY

Despite the hard work, there were men who stayed at the plant for decades. An article from a 1964 issue of the *St. Louis Park Sun* named numerous men who had worked there for many years, some over 40.

The guys at the plant were patriotic; in 1942 they worked an extra half day on a Saturday and donated their wages to the St. Louis Park Red Cross War Fund. The company paid the men time and a half for overtime and turned the sum of $367.46 over to C.L. Hurd, drive chairman.

A 1966 ad in the *Dispatch* boasted that "*Republic might well be called the 'Heart of the Park' because it has pumped the lifeblood of economic security into the community*."

Engine Crew

CREOSOTE AND PARK'S ENVIRONMENT

The following information comes, for the most part, from newspaper articles and government sources. It is intended to be an objective account of the actions that have been taken to clean up the site and ensure that St. Louis Park's water is safe to drink. Readers are encouraged to **contact us** with additions or corrections.

Sources and Acronyms

AJPH: In March 1988 the *American Journal of Public Health* published a Commentary entitled "Usefulness of Comprehensive Feasibility Studies in Environmental Epidemiology Investigations: A Case Study in Minnesota." Information from that article is identified as **AJPH**.

ATSDR: ***Agency for Toxic Substances and Disease Registry***. *On December 9, 1992, a Public Health Assessment was prepared by MDH under a Cooperative Agreement with the ATSDR.* Information from that assessment is identified below as **ATSDR**.

EPA: U. S. Environmental Protection Agency

HRA: St. Louis Park Housing and Redevelopment Agency

MDH: Minnesota Department of Health. In the spring of 1984 the Minnesota Legislature provided funding to the Chronic Disease and Environmental Epidemiology Section of the MDH to evaluate the feasibility of conducing a community-wide

epidemiologic study of drinking water and health in St. Louis Park. MDH presented its report to the Legislature on December 31, 1985. Information below from that study is identified as **MDH** and the page number of the report.

MPCA: Minnesota Pollution Control Agency

USGS: U.S. Geological Survey

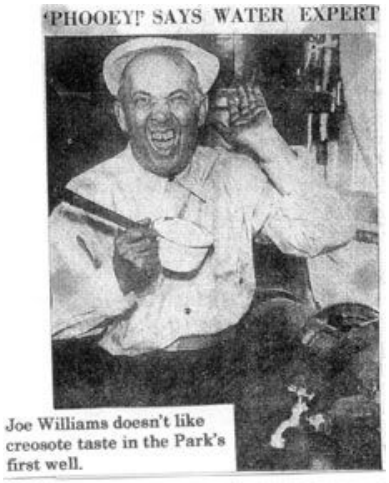
Timeline: Timeline published on April 28, 1986 in the *Sun Sailor*

*Information about specific wells in the Park is at **Water and Plumbing**.*

Complaints about the plant came almost immediately. On April 4, 1918, one L.W. Fuller appeared before the Village Council to protest the "nauseating, disagreeable odor" emanating from the plant. A representative from the plant assured the Council that the proper machinery would arrive soon that would complete the necessary connections.

It was no secret that creosote was being released into the environment. "From 1917 to1939, raw waste water containing coal tar and creosote was discharged into a drainage ditch that originated in the northern portion of the site and ran the length of the site (approximate path was NE to SW). Historical aerial photographs show the northern portion of the site possibly contained a waste disposal area. Once off-site, the drainage ditch connected with a series of other ditches which eventually emptied into a small marsh approximately 600-700 feet south of the site. In 1940/1941, Reilly installed a waste water treatment plant, but continued to discharge the effluent off-site until operations ceased in 1972." (ATSDR)

In the early days of the Village, water came from Minneapolis mains. Complaints about chlorine and algae prompted the Village to spend $17,000 on a 1,000 ft. municipal well in 1934. From an anonymous memoir: "The old Milwaukee [Road] artesian well was the coldest water in St. Louis Park. They drilled close to that well. They pumped it for at least 24 hours. After 24 hours [two weeks], it started to draw creosote." The *Minneapolis Tribune* showed **Joe Williams** with a horrible expression on his face as he tasted the local brew - the headline read: "Phooey! Says Water Expert." The well was located east of the Creosote Plant. Since groundwater in this area flows east/southeast toward the Mississippi River, creosote was leached into the water supply. After using the well for about eight months [several weeks], the Village Health Department shut it down.


'PHOOEY!' SAYS WATER EXPERT

Joe Williams doesn't like creosote taste in the Park's first well.

In the 1950s and '60s the presence of creosote in the environment, and particularly the odors that were the result of the process, became untenable as the City developed around it. In addition, the plant was in the way of plans to extend Louisiana Avenue from 32nd Street to Oxford.

As early as 1960 the State started to pressure Reilly to clean up the site, and by 1961 the City was working to remove the plant. In order to request urban renewal funds from the Federal government the City had to establish a Housing and Redevelopment Authority (HRA), and in order to establish an HRA the City had to show that there was urban blight. The City Council passed a resolution to form an HRA in March 1962, but Reilly obtained an order from a County District Judge, preventing the resolution from becoming effective until it was reviewed by a court. Reilly attorney John Yngve said he believed there was no blight in St. Louis Park requiring an HRA. (*Minneapolis Star*, March 7, 1962). According to a June 15, 1972 article in the *Minneapolis Tribune*, "Reilly took the city to court, its lawyer John Yngve contending that St. Louis Park had no blight, and that urban renewal was only a scheme

to evict Reilly's Republic Creosoting division. Herbert Finch, the plant manager, said Reilly already had spent thousands of dollars to eliminate smoke and minimize odors and would cooperate in any way possible to be a good neighbor." The HRA would not be established until 1970.

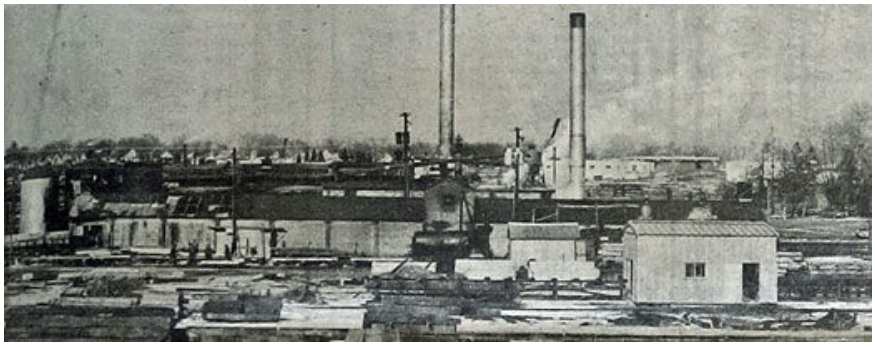
In September 1969 Hickok and Associates, an engineering firm hired by the City, found phenols in the soil and water from city wells. (timeline)

On October 2, 1970, the State (Attorney General Douglas M. Head), through the MPCA, and the City filed a complaint in Hennepin County District Court alleging violation by Reilly of State and local pollution laws and regulations. (timeline) A 1972 article in the *Minneapolis Tribune* reported that "The company resisted initial attempts to inspect the land and take pollution samplings, but Head won a court order permitting the tests."

The City HRA was formed in 1970, and Reilly Tar and Chemical went to the Minnesota Supreme Court in order to get what it considered fair value for the land.

Meanwhile, the plant was becoming financially untenable for the company. The 1970 bankruptcy of the Penn Central and other railroads knocked out the market for ties, and the move to put utility lines underground reduced the need for telephone and electric poles.

In March 1971 plant manager Herb Finch announced that the plant would be closed by September 1972. At the time the plant employed 85 people. (*Sun*, March 25, 1971)



The refinery was phased out starting in the summer of 1971. The timeline cites the plant closing in September 1971, and a purchase agreement executed for the purchase of the site by the City for $1.9 million on April 14, 1972.

A *Minneapolis Tribune* article dated June 15, 1972, stated that the plant would close on June 30, 1972. As of the 15th the refinery building had already been razed and the treatment plant would be demolished in July. 80-90 employees (with an annual payroll of about $500,000) were affected by the closure. Herbert Finch was the last General Manager.

A companion article in the *Tribune* said that the City was expected to receive a $1.3 million Federal grant to replace the plant with the Oak Park Village development, an 80-acre urban renewal project along Highway 7. The plan then was to build $35 million to $50 million worth of privately developed homes, apartments, townhouses, offices and stores, starting in 1975. Approximately 1,000 homes were projected to be built by 1976.

In December 1972 the City received approval for a grant from the US Department of Housing and Urban Development's Neighborhood Development Program totaling $1.8 million to redevelop the site. (timeline) Funds were received in April 1973. The Federal government would provide 75 percent of the cost; extending Louisiana and installing utilities constituted the City's 25 percent match.

The site was purchased by the City on June 19, 1973. In an October 28, 1977 article in the *Sun*, Mayor Irving Stern said "At this time, the MPCA indicated that if the city should acquire this land, sealant soil could be placed on the surface and no excavation of the contaminated soil would be required. The city relied on this statement and ceased its insistence on an indemnification agreement from Republic Creosote and agreed to buy the property without such a clause." The City signed a hold-harmless agreement with Reilly (against "soil and water impurities") as a substitute for dismissal by the State of the 1970 County lawsuit. (timeline) The State's lawsuit went into abeyance and was reactivated in1977.

The St. Louis Park Housing and Redevelopment Authority bought the property from the City on June 21, 1973. (timeline)

In January 1974 the MDH found phenols in municipal wells. (timeline)

In April 1974 the City retained Gerald Sunde to conduct a hydrogeological study. Sunde concluded that wells open to several aquifers may provide a route for the spread of contamination. (timeline)

An article in the *Sun* dated September 4, 1975 told of the City's efforts to abate the phenol-bearing creosote oils by growing oats on the land. The "land farming" efforts involved spreading the soil about one foot thick over the northwest part of the site, fertilizing and planting with oats. The plants (then four inches high), would be plowed under and a new crop planted, leading to biological action in the soil designed to break down the phenols. The process was being monitored by scientists at the U of M. The City was also working on a settling basin for the planned storm sewer network that would serve the planned Oak Park Village residential development. Water would trap and precipitate storm waterborne solids before they reach the system's discharge point on Minnehaha Creek. The run-off would be further purified chemically at a lift station-treatment plant between the basin and the creek. The bottom of the basin would be sealed with a plastic coating to prevent seepage of any phenol-bearing water into the soil and city water supplies.

In December 1976 the MPCA gave the City approval to develop the northern end of the site. As of November 1977, construction had not yet begun. (*Sun*, November 18, 1977)

From 1975-1977 Barr Engineering studied the magnitude and extent of contamination, funded by the State. The first phase of the report determined that there were low levels of contaminants in the top 10 to 15 feet over most of the site and there were higher concentrations on the southern part of the site. The second or final phase of the study looked at ground water flow and determined that there were high concentrations of waste 50 feet down and that the wastes had moved laterally at least 1,000 feet. The contaminants were projected to move southeastward at a rate of 30 to 150 feet per year. The study recommended that wells be abandoned in the area bounded by Texas Ave., Minnetonka Blvd., Highway 100, and Excelsior Blvd.; abandon wells 1, 2 and 3; construct gradient control wells a pump water from those wells with the more highly contaminated water treated and discharged to Minnehaha Creek; conduct further studies to define the treatability of the ground water and determine the potential health hazard. (*Sun*, October 28, 1977)

The MPCA reviewed the Barr Report (above) and concluded that the well abandonment should be carried out immediately. It supported the recommendation that barrier wells be constructed to contain the contamination, but noted that if the barrier wells did not function as anticipated for if further studies identified other significant problems, additional corrective measures may be required. The MPCA also said that limited untreated discharges to the city sewer system should be allowed in order to collect sufficient data for treatment plant design. (*Sun*, October 28, 1977)

At the same time, the MDH issued a report saying that the contamination posed significant potential health problems and threatened the heavily used underground water sources. It recommended that construction of the Oak Park Village development be halted immediately pending a complete environmental review of the area. Deeper barrier

wells and excavation of the site may be necessary. (*Sun*, October 28, 1977)

Although Reilly had sold the site to the City in 1973 with a hold harmless clause, in 1977 the State reactivated its lawsuit.

In the Fall of 1977, the City and the State were haggling over who was responsible for paying for the remediation activities recommended by the Barr report.

In an article dated December 9, 1977 in the *Sun*, it was reported that the MPCA citizen board put the city on notice that it is proceeding with the development of the Oak Park Village development, on the north side of the property, at its own risk. The City countered that studies indicated that soil contamination was not a problem in that area.

The Somerset Oaks and Oak Park Village Apartments were built on the northern edge of the property in 1978.

In July 1978 the MDH contracted with the US Geological Survey to define groundwater flow and movement of contaminants. (timeline)

In October 1978 MDH identifed the presence of polynuclear aromatic hydrocarbon (PAH) compounds in four city wells located 1/2 mile from the Reilly site. Wells 7, 9, 10, and 15 were shut down, reducing the City's water supply by 9 percent. (timeline) Chemicals found in the water included anthracene, fluoranthene, pyrene, and napthalene. These are considered non-cancer causing PAHs.

The contaminants had leaked into the 250-500-ft. deep Prairie du Chien-Jordan aquifer. The bedrock aquifer "is generally considered to be well protected from surface contamination due to a thick sequence of overlying materials including glacial drift, two bedrock aquifers, and two bedrock confining units." (MDH 4-3)

Well 4 was shut down in November 1979, located 1.5 miles from the Reilly site, and the City conducted a study of processes to remove PAH compounds. (timeline)

In an article dated November 28, 1979, the *St. Louis Park Sun* reported "A horror story of sorts was revealed by a federal official to those attending a citywide meeting on water quality last week at the high school." Don Albin of the U.S. Geological Survey presented a slide show describing how creosote may have seeped into the water supply. USGS installed 80 wells to study the water and its movement within the aquifers, and was measuring water level changes on 1665 sites throughout the city. The article reported "The Prairie Du Chien-Jordan Aquifer between 300 and 400 feet was contaminated by an open-cased well on the plant site. Spilled creosote then leaked into a deep well in the Mt. Simon-Hinckley Aquifer some 900 feet below the surface. A probe inserted to a depth of 587 feet came up covered with a tarry substance. A color slide showed the same color water being pumped from one of the wells on the site." MDH reported that $70,000 had been spent so far to close down and seal wells, and $200,000 had been paid to USGS for its studies. City Public Works director Dick Koppy reported that the city was working on a carbon absorption pilot treatment study. It was pointed out that no single resident or business was served by one well. Water used by residents was taken from the total system.

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as the Superfund law, was enacted in 1980. This law set up a fund to identify and clean up our country's hazardous waste sites. The law also provided for the creation of the Agency for Toxic Substances and Disease Registry (ATSDR), an agency of the U.S. Public Health Service.

In February 1980 the EPA granted the City $400,000 in Superfund money to begin planning and design work for the eventual cleanup of the contamination. $200,000 of the grant was released in July 1981; an article in the *Sun* dated September 2, 1981, said that the remainder of the money had been delayed.

In June 1980 the City retained Hickok and Associates to prepare a feasibility study on

the carbon absorption processes. In November 1981 the study concluded that addressing containment of the contaminants is a top priority. (timeline)

In September 1980 the Federal Government sued Reilly in Federal District Court under the Superfund law – the first suit of its kind. In October the Federal court agreed to hear State claims in addition to Federal claims.

On November 5, 1980, Dick Koppy, Director of Public Works, was quoted in the *Echo*: "Reilly dumped creosote directly onto the ground without using sanitary or holding facilities. The creosote plant was a haphazardly controlled site."

In 1980 condos were built at 3320 Louisiana, about at the middle of the tract on the eastern edge.

In February 1981 Hopkins Well 3, 1 mile from the Reilly site, was closed.

In July 1981 the EPA released $200,000 to the MPCA for well evaluation and survey. (timeline)

On August 17, 1981, the City closed Well 5, 1.5 miles from the site. The well was used only during the summer months. (*Minneapolis Star*, August 20, 1981)

In October 1981 the City began drilling Deep Well 17 to increase the water supply. In December the City signed an agreement with Plymouth for water connection for Shelard Park. (timeline)

In January 1982 the City adopted a policy calling for completion of a water-treatment study to allow a facility to be in operation by September 1983, a health-risk study, and a study to delineate the boundaries of source fluids and materials to evaluate requirements of a gradient control well system. (timeline)

In June and July 1982, workers dredged nearly 1,000 gallons of coal tar, sludge and debris from the company's supply well. The well was located near the refinery building and had served as a water supply to the plant's operations since it opened in 1917. A plug of coal-tar material was found at about 595 feet. It was about 140 ft. long and seven inches wide. Although it contributed to the contamination of adjacent aquifers, the plug may also have sealed off deeper aquifers from additional contamination after some point in time. (MDH 4-6) Well drillers dredged down to 840 feet and filled 18 - 55 gallon drums with materials from the well. The well originally went to 909 feet and drillers continued their cleanup slightly beyond that point. MDH and MPCA officials suspected that the well was contaminated through spills as early as the 1920s or 1930s. There were also stories that Republic used the well to discharge waste water in the '30s. The coal tar did not appear to reach into the Mt. Simon-Hinckley aquifer, which begins at about 900 to 1,000 feet. *St. Louis Park Sun*, July 28, 1982.

In August 1982 the MPCA retained CH2M Hill to complete and evaluation of groundwater treatment and potable water supply alternatives. (timeline)

On August 16,1982, the EPA announced that $1.9 million would be available in October. The money did not reach Minnesota until December 21, and in an article dated February 26, 1983 in the *Minneapolis Star and Tribune*, Rep. Gerry Sikorski announced that Congress would investigate the delay. The EPA was caught up in a scandal, with President Reagan firing Assistant Administrator Rita Lavelle in February 1983. Sikorski was not ruling out incompetence, lack of sincerity in enforcement, politics, or criminal wrongdoing.

The Minnesota State Superfund bill (**Environmental Response and Liability Act**) was enacted by the Minnesota Legislature on May 10, 1983 with a cap on municipal liability.

On May 16, 1983, MPCA and CH2M Hill presented its recommendation for a granular activated carbon (GAC) treatment system at wells 10 and 15. The presentation was

made in a public meeting at the high school.

On May 19, 1983, Environmental Research and Technology, Inc. (ERT) out of Pittsburgh, consultant for Reilly, presented a cleanup plan suggesting that iron-removal processes will remove PAH compounds. The 1,400-page study took 20 scientists 18 months to draft at a cost of $600,000. (*St. Louis Park Sun*, May 18, 1983). A week later, the *Sun* reported "Reilly Proposal Draws Fire, Praise: Anger, incredulity, political rhetoric, confusion and grudging respect - reactions to the Reilly Tar & Chemical Corporation's plans for handling soil and groundwater contamination in St. Louis Park covered the whole spectrum." State Representative Gloria Segal was particularly incensed that Reilly hadn't shared its information with public officials before making the plan public. (*Minneapolis Star and Tribune*, May 19, 1983). In a July 7, 1983 article in the *Minneapolis Star and Tribune*, it was reported that "The St. Louis Park City Council Tuesday listened as Mayor Lyle Hanks read a letter from Tom Reilly Jr. offering to make his consultants available to discuss their analysis of the city's water contamination. No one took him up on the offer. Instead, council members voted to endorse the state's approach to removing coal tar contaminants from the city's groundwater and restoring the municipal water supply."

Articles dated June 9 and 23, 1983 in the *Minneapolis Star and Tribune* suggested that the proposal was an effort to settle the issue out of court, but that there was a huge disconnect when it came to the perceived safe level of PAH compounds: MDH recommended a level of no more than 280 parts per trillion of non-cancer causing PAH compounds, pointing out that many of the compounds are presumed to be non-cancer causing but have not been studied thoroughly. ERT contended that the water would be safe to drink with the compounds in concentrations of 4,000 to 400,000 parts per trillion. Also at odds was the method of removal, with MDH advocating the GAC method.

On July 5, 1983, the City adopted a policy calling for confirming health-risk criteria for PAH compounds, proceeding with development of water-treatment alternatives and a study of source fluids, continuing multi-aquifer well-abandonment activities, and reviewing data and findings submitted by Reilly. (timeline)

In December 1983 the City and Reilly reviewed the Consent Decree and Remedial Action plan and negotiated implementation of remedial measures to allocate funding and performance responsibilities. (timeline)

On June 6, 1984 the EPA issued a decision on the CH2M Hill drinking water treatment study, making the project eligible for Federal funding. (timeline)

On August 1, 1984, the EPA issued an order requiring Reilly to design and construct a drinking water treatment system. (timeline)

In September 1984 the USGS completed its groundwater modeling effort, permitting analysis of gradient control systems to prevent further spread of contaminated groundwater. (timeline)

In October 1984 the MPCA completed cleanout and investigation of two deep wells on the site. (timeline)

On August 28, 1985 MPCA and MDH approved the design of a GAC water treatment plant submitted by Reilly. The plans were approved by the EPA on September 10. Construction of the plant began on September 19, built by Calgon Carbon Corp. The plant, located at 2936 Jersey, was completed on December 27, 1985. (timeline) Reilly paid the $750,000 cost of the plant, which was built to filter water from wells 10 and 15. Opening of the plant permitted the reopening of four wells closed due to high levels of PAH. Another well was to open later, and a sixth well was closed. The plant consists of two filtering devices inside a brick structure. The plant could treat 1,200 gallons per minute, 1.7 million gallons per day. (*MSN Sailor*, December 9, 1985)

In September 1986 Reilly reached an agreement with City, State, and Federal agencies to clean up the site and maintain the City's drinking water for 30 years. The objectives of

the Consent Decree-Remedial Action Plan (CD-RAP) were "1) provide a safe drinking water supply in sufficient quantity for the City and surrounding communities, 2) control the spread of contamination in the regional aquifers, 3) allow for safe, reasonable, and beneficial use of the site and adjacent contaminated areas, and 4) preserve and protect groundwater resources for present and future uses. The fulfillment of the RAP portion of the CD-RAP will constitute the full settlement of all pending claims against Reilly Tar and Chemical Corporation." (ATSDR)

An article from 1993 in the *Sun* indicates that Reilly paid the EPA $1.7 million, put $1 million into the Superfund, paid the City $1 million, and paid for the treatment plant and some capital equipment.

"One provision of the CD-RAP requires that each well that may be affected by contaminants from the site, and which is used to supply area residents with drinking water, be monitored for the presence of PAHs. Monitoring is performed, depending on which aquifer the well draws water from, either annually, twice yearly, or quarterly." (ATSDR)

"Groundwater samples taken for PAH analysis are obtained directly from the individual source wells; there is no analysis for PAHs after the water from the source wells is routed to the St. Louis Park municipal water supply and distribution system. Prior to its arrival at the tap, the water in the supply and distribution system may undergo chemical and physical treatment (for example aeration, chlorination, fluoridation), remain in storage (tanks and/or water mains) for variable periods of time, and be mixed with water from other source wells which do not contain PAHs (this will lower the concentration of the contaminants in the water supply because of dilution). Each of these steps may have an impact on the concentration of PAH(s) to which an individual may be exposed." (ATSDR)

In 1991, "the City carried out an air monitoring program during phases of the Louisiana Avenue/Highway 7 construction project. Air monitoring for organic vapors (using an HNumeter) took place from June through October, 1991 at the perimeter of the construction zone. There were no reported organic vapor measurements above background at any sampling point during that sampling period. On July 2, 1991, one upwind and two downwind 10-hour air samples were collected using personal air samplers during construction activities in an area south of Walker St. and north of Highway 7. The samples were analyzed for semivolatile organic compounds listed on the U.S. EPA Target Compound List; chemicals on this list include phenolics, carcinogenic PAHs, and noncarcinogenic PAHs. None of these chemicals was found above the reportable detection limit." (ATSDR)

An article in the *Sun* dated January 20, 1993, quotes Jim Grube director of Public Works, saying "Besides putting clean fill on top, nothing has been done with the contaminated soil because there was no way to effectively deal with the problem. According to the EPA, there is about two million cubic yards of contaminated soil beneath the site. The EPA now thinks the bioventing technique may be useful." A companion article described bioventing as a biological treatment process where a blower continuously injects warm air (50 degrees) into the ground under low pressure. The oxygen that is put into the soil aids the growth of aerobic microbes, which are naturally present in the soil. The microbes attack the PAH contaminants, converting them to carbon dioxide and water. This breakdown process occurs naturally, but the EPA hopes to speed up the process with bioventing. Workers from the Public Works Department sampled the site every two weeks, checking the oxygen and carbon dioxide levels. The test was scheduled to last three years. The testing site consisted of a small mobile trailer and two small fenced areas in Oak Park Village along Louisiana Ave. just north of Highway 7.

The **MDH's Source Water Assessment** for 2011 indicates: "One or more contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water. However, the water supplied to users meets state and federal drinking water standards for potability."

Results of water monitoring can be found in the City's annual **Water Report** for 2013.

CREOSOTE AND CANCER RATES

Findings of the 1985 MDH Report

A national survey of cancer incidence for the Minneapolis-St. Paul metropolitan area was conducted in 1969-71. The data were analyzed in 1979 and it was found that none of the 45 types of cancer examined were elevated in men who resided in St. Louis Park at the time of diagnosis. For women, however, the rate was 33 percent higher overall, and 45 percent higher for breast cancer. (MDH E-13)

"It was known that a significant percentage of the St. Louis Park population was Jewish and that several epidemiologic studies have shown Jewish women have a higher risk of breast cancer." (MDH 4-56) However, even if it were assumed that the Jewish population had a twofold risk, the higher incidence of cancer would not be entirely explained by Park's high (20 percent) Jewish population. (MDH 4-64)

During the 18 months after the release of the report, additional additional analyses of the St. Louis Park breast cancer rates were completed. "These data were consistent with previous interpretations that the increased breast cancer in the community was largely attributable to the Jewish population." (AJPH p. 289)

"Diet [is] the primary source of exposure to carcinogenic PAH in the general population, and that exposures from food exceeded exposures from contaminated St. Louis Park well water. For noncarcinogenic PAH, however, consumption of water with PAH levels found in the most highly contaminated wells could have equaled or exceeded estimated intake from food sources." (AJPH p. 289)

Exposure

Breast cancer has a period from initial exposure to manifestation of disease is at least ten years between exposure to radiation and increased risk of breast cancer, and could be ten to thirty years for other cancers associated with chemical exposure. Determining a woman's exposure is complicated; for example, the 1970 census showed that only 55 percent of the population in St. Louis Park had lived in the same house five years earlier. Tracking women who had moved out of the area would also be difficult. (MDH 4-58)

Also relevant to exposure are the employees of the plant, who were almost exclusively men. Employee information provided by Reilly Tar and Chemical shows that the vast majority of their St. Louis Park employees between 1950 and 1972 were employed for less than five years, and that the average duration of employment was slightly over three years. (MDH E-15) Nevertheless, employees were directly exposed to the many chemicals involved with the process, and yet there was no discernable increase in cancer among men.

"Despite the extensive information base that is available regarding contamination of groundwater and municipal wells in St. Louis Park, it is not presently possible to identify either the duration or the magnitude of community exposure to water contaminants." (MDH 4-24)

Conclusions of the 1985 Report

"It does not appear likely that the observed excess of breast cancers in St. Louis Park in 1969-71 could be related to water contaminants." (MDH E-14)

"The extent to which the observed breast cancer rate in St. Louis Park can be explained on the basis of known risk factors remains unclear." (MDH 4-65)

"The overall conclusion of the [MDH] study was that valid large-scale epidemiologic

studies could not be conducted and were not warranted in this situation." (AJPH p. 289)

The MDH study concluded that "it was very unlikely that any type of study would be able to directly address the impact of ingestion of PAH-contaminated water and subsequent cancer development ... 1) no valid assessment of individual exposure was possible due to considerable uncertainty about historical distribution of contaminants and no reliable measure of cumulative exposure to PAHs, 2) the continuous non-water exposures to PAHs could not be measured reliably, and their effects could not be distinguished from possible exposure via water, and 3) there existed no means to identify and control the wide variety of factors which could confound or modify any association (apparent or real) between the presumed PAH exposure of interest and particular health outcomes." (ATSDR)

Recommendations of the 1985 Report

"A statewide cancer surveillance system should be instituted to enable the systematic collection and analysis of cancer incidence data." (MDH E-19)

"Existing State-collected mortality data should be monitored for possible excesses and/or time trends that are suggestive of an existing or emerging public health problem in this community." (MDH E-20)

"Further insights into historical patterns of well contamination could possibly be gained through additional data collection and computer modeling with the USGS groundwater flow model for St. Louis Park. It is believed by the USGS that, given adequate time and other resources, more specific and refined simulations (based, for example, on actual pumpage over short intervals of time) could be developed that might provide some insight into historical patterns of groundwater contamination.." (MDH 4-17)

"A mortality study examining cancer deaths could be conducted. Cancer mortality over time and in comparison to similar communities and to the Metro area could be examined. Specifically, cancer rates from approximately 1948-1952, 1958-1962, 1968-1972, and 1978-1982 could be calculated. These time periods surround the census years for which accurate population data are available, a necessity when determining rates. Wells that were contaminated between 1978-81 were installed between approximately 1947 and 1969. It might be assumed then that 1950 (and probably 1960) rates would represent cancer mortality before any possibly effects from the contaminants would occur. The 1970 and 1980 rates could represent the community's mortality experience several decades following possible onset of exposure. (This is speculative since it is not actually known when wells became contaminated or to what extent contaminants were actually present in tap water.) Calculating rates over 5-year periods in lieu of annual rates increases the person-years of observation and therefore increases the chances of detecting a true elevation in mortality. The St. Louis Park mortality rates would need to be compared to those in similar communities (e.g., Edina and Richfield), as well as to the Metro area during the same period." (MDH 5-10)

"Cancer incidence in St. Louis Park could be monitored for the period 1972 to 1986 to determine whether the previous excesses still exist or other cancer rates have increased or decreased in women or men." (MDH 5-24)

MCSS

The Minnesota Cancer Surveillance System (MCSS) was established on January 1, 1988, and all cancers in Minnesota residents are reported to the Minnesota Department of Health.

1992 Study

On December 9, 1992, a Public Health Assessment was prepared by MDH under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry.

The conclusion, in part, reads:

> Based on the information and data reviewed, the MDH concludes that the Reilly Tar and Chemical Corporation site poses no apparent public health hazard.
>
> At present, local residents use water drawn from some municipal wells which contain low levels of PAHs. Exposure to these compounds may occur via ingestion of and possibly dermal contact with potable water. However, concentrations of PAHs in the water from these wells are monitored to assure that they are below Drinking Water Criteria established in the CD-RAP (see Public Health Implications). As long as the concentrations of PAHs in these wells remain below the Criteria, exposure to them via drinking water use is not of public health concern.
>
> ...
>
> The provisions of the 1986 CD-RAP are continuing to guide the remediation of the Site. Many remedial activities have been completed, and others are on-going. Briefly, remedial activities have included: installation and operation of contaminant source control wells, installation and operation of contaminant gradient control wells, installation and operation of granular activated carbon treatment systems on two municipal wells to remove PAHs, implementation of a comprehensive groundwater monitoring program, closing of multi-aquifer wells that allowed contaminants to migrate to deeper aquifers, excavation and removal of on-Site contaminated soils during past demolition and construction activities, construction of storm water retention ponds to control surface run-off from the Site, and off-Site wetland filling (in the area where waste water discharge occurred during plant operations).
>
> ...
>
> In accordance with the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended, the Reilly Tar and Chemical Corporation site has been evaluated for follow-up health activities. Although human exposure to site contaminants is currently occurring via drinking water use, this exposure is not occurring at levels of public health concern. Prior to 1978, exposure to higher concentrations of contaminants may have occurred. However, because extensive environmental groundwater sampling did not occur prior to 1978, it is not possible to evaluate the significance of this past exposure. A community health education effort related to this site was undertaken. The Minnesota Department of Health and the Minnesota Pollution Control Agency have distributed fact sheets and conducted/attended numerous public meetings. Community health education activities are ongoing. This site is not being considered for additional follow-up health activities at this time. However, if data become available suggesting that human exposure to hazardous substances at levels of public health concern is occurring, ATSDR and the Minnesota Department of Health will re-evaluate this site for any additional follow-up health activities.

2002 Report

In 2002, the ATSDR issued a Toxicological Profile for Creosote. The report indicates that "The International Agency for Research on Cancer (IARC) has determined that coal tar is carcinogenic to humans and that creosote is probably carcinogenic to humans. EPA has also determined that coal tar creosote is a probable human carcinogen." The finding is in the context of direct exposure, and not exposure through the water supply.

2005 Study

A 2005 mortality study of creosote workers found no evidence supporting an increased risk of cancer death, as a result of exposure to creosote. Based on the findings of the largest mortality study to date of workers employed in creosote wood treating plants,

there is no evidence that employment at creosote wood-treating plants or exposure to creosote-based preservatives was associated with any significant mortality increase from either site-specific cancers or non-malignant diseases. The study consisted of 2,179 employees at eleven plants in the United States where wood was treated with creosote preservatives. Some workers began work in the 1940s to 1950s. The observation period of the study covered 1979-2001. The average length of employment was 12.5 years. One third of the study subjects were employed for over 15 years. This finding is consistent with the observations of Tom Renner, a well driller for many years in St. Louis Park and friend to many of the men who worked at the plant for decades. He saw no inordinate rate of cancer and in fact observed that most of them lived into their 80s.

Current Monitoring and Statistics

The Minnesota Cancer Surveillance System was established in 1988 and all cancers in Minnesota residents are reported to the Minnesota Department of Health. John Soler, epidemiologist, Health Promotion and Chronic Disease Division, Chronic Disease and Environmental Epidemiology Section at the MDH, provided this information in November 2012:

> For the most recent past 10 years of available data (2000-2009), 2717 cancers of all types occurred in residents of 55416 and 55426. We would have expected 2850 cancers in those two zip codes if they had the same cancer rates as the 7 county metro area. So it is slightly lower than the metro average.
>
> For breast cancer, 433 were diagnosed in residents of these two zip codes – 436 would have been expected based on the metro area breast cancer rate. In short, cancer rates in these two zip codes (which include most of St Louis Park and a bit of other areas) are about the same as the metro rates.